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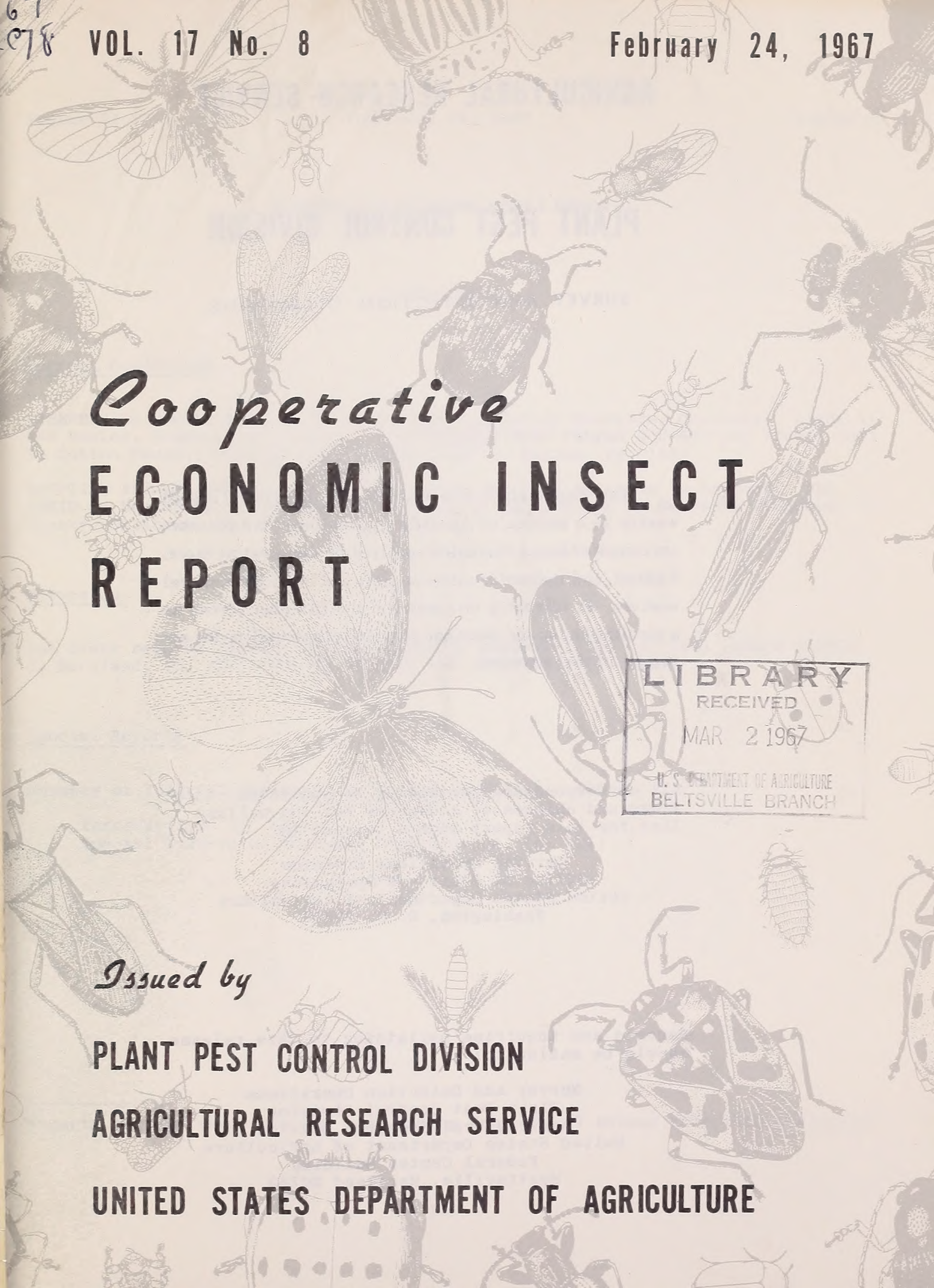

Cooperative ECONOMIC INSECT REPORT

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PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

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SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 17 February 24, 1967 Number 8

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG is threatening in Cotton, Caddo and Garvin Counties, Oklahoma. Light in New Mexico, Arkansas and Kansas. BROWN WHEAT MITE ranged 500-600 per linear foot in Cotton County, Oklahoma; continues light in Kansas. (p. 115).

EGYPTIAN ALFALFA WEEVIL showing some signs of rapid increase in Arizona. PEA APHID is beginning to increase on alfalfa in Arizona and is heavy in Stephens County, Oklahoma. (p. 116).

Detection

New State records include COCONUT SCALE in Pennsylvania, (p. 117), LARCH SAWFLY in Maryland, (p. 117), and an ASTEIID FLY in Hawaii, (p. 119).

Special Reports

Summary of Insect Conditions in the United States - 1966.

- Introduction. (p. 121).
- Special Insects of Regional Significance. (p. 121).

Reports in this issue are for week ending February 17 unless otherwise indicated.

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WEATHER BUREAU'S 30-DAY OUTLOOK

MID-FEBRUARY TO MID-MARCH 1967

The Weather Bureau's 30-day outlook for mid-February to mid-March calls for temperatures to average below seasonal normals east of the Continental Divide except for near normal over most of the gulf and south Atlantic coastal regions. West of the Divide above normal temperatures are indicated for the Great Basin and the Northwest. Elsewhere near normal temperatures are indicated. Precipitation is expected to exceed normal over western portions of the northern Plains, and from the central Plains eastward through the middle Mississippi Valley to the Appalachians and northward to the Great Lakes region. Subnormal precipitation is expected to be confined to northern and central portions of the West Coast States while near normal totals are called for in unspecified areas.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Buearu. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price $5.00 a year.

For weather of the week, see page 119.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

GREENBUG (*Schizaphis graminum*) - NEW MEXICO - Ranged 0-6 per foot of row on wheat in Curry and Roosevelt Counties. (Mathews, Nielsen). OKLAHOMA - Ranged 50-100 per linear foot in Cotton, Caddo and Garvin Counties on wheat; 20-30 per linear foot on Comanche County barley. Light in 16 other counties. (Okla. Coop. Sur.). KANSAS - Light on wheat in Labette, Neosho and Montgomery Counties; ranged 0-5 per foot of row, with up to 10 per foot of row in one field. None found in southeast, northeast and east-central districts. (Simpson). ARKANSAS - Light on wheat in Lincoln, Poinsett, Craighead and Jackson Counties. Reproduction underway. (Ark. Ins. Sur.).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - ARIZONA - Light in scattered areas of Maricopa County, mostly in Chandler and Buckeye areas. (Ariz. Coop. Sur.). KANSAS - Very light, less than 5 per square foot, in few fields of alfalfa in Elk and Wilson Counties. (Simpson). ARKANSAS - Survey negative in Faulkner County. (Ark. Ins. Sur.). MISSISSIPPI - Light on alfalfa in Lee County, with no damage apparent. (Dinkins).

CORN LEAF APHID (*Rhopalosiphum maidis*) - ARIZONA - Increasing rapidly on small grain in Maricopa and Pinal Counties. (Ariz. Coop. Sur.).

ARMY CUTWORM (*Chorizagrotis auxiliaris*) - OKLAHOMA - Ranged 2-7 per 10 linear feet in all wheat checked in Noble, Kay, Grant and Garfield Counties. (Okla. Coop. Sur.). KANSAS - Single larva found on alfalfa in Butler County. (Simpson).

SMALL GRAINS

BROWN WHEAT MITE (*Petrobia latens*) - OKLAHOMA - Counts per linear foot in wheat ranged 500-600 in Cotton County; 50-150 in Beckham, Jackson and Garfield Counties. (Okla. Coop. Sur.). KANSAS - Continued light on wheat in Montgomery, Labette and Cherokee Counties; averaged less than 10 per foot of row. (Simpson).

WINTER GRAIN MITE (*Penthaleus major*) - KANSAS - Continued light on wheat in Montgomery, Labette and Cherokee Counties; averaged less than 10 per foot of row. (Simpson).

ENGLISH GRAIN APHID (*Macrosiphum avenae*) - ARKANSAS - Numbers low in wheat in Lincoln, Poinsett, Craighead and Jackson Counties; only occasional aphid found. (Ark. Ins. Sur.). FLORIDA - Populations appear unchanged on rye and oats at Gainesville, Alachua County. (Mead).

LEAFHOPPERS - FLORIDA - Several species increasing on rye at Gainesville, Alachua County; *Graminella nigrifrons* dominant with 70 adults per 100 sweeps. (Mead).

GRANULATE CUTWORM (*Feltia subterranea*) - ARIZONA - Light on small grain in scattered fields in Maricopa County. (Ariz. Coop. Sur.).

TURF, PASTURES, RANGELAND

AN OLETHREUTID MOTH (*Cactra verutana chrysea*) - CALIFORNIA - Heavy populations on chufa flatsedge at Shafter, Kern County. (Cal. Coop. Rpt.).

A MEALYBUG (*Chorizococcus rostellum*) - CALIFORNIA - Locally medium on Bermuda grass at La Mesa, San Diego County. (Cal. Coop. Rpt.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - MISSISSIPPI - Moderate on alfalfa in Lee County. Larvae 30 per square foot, causing considerable damage to leaves. (Dinkins). VIRGINIA - In square-foot sample of alfalfa collected at Charlotte Courthouse, Charlotte County, 29 percent of eggs hatched. Of larvae present, 50 percent alive. (Woodside).

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) - ARIZONA - Larval populations show some signs of rapid increases on alfalfa in Maricopa County. (Ariz. Coop. Sur.).

GRANULATE CUTWORM (Feltia subterranea) - ARIZONA - Light on alfalfa in few Maricopa County fields. (Ariz. Coop. Sur.).

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Beginning to increase on alfalfa in western Maricopa County and in Chandler area. (Ariz. Coop. Sur.). NEW MEXICO - Continues light on most alfalfa in Chaves County. (Mathews). OKLAHOMA - Heavy in overwintering alfalfa in Stephens County; averaged 350 per square foot of crown. (Okla. Coop. Sur.). KANSAS - Ranged 0-10 per square foot in alfalfa in Chautauqua, Montgomery, Labette, Neosho, Cherokee and Crawford Counties. (Simpson). ARKANSAS - None found in alfalfa in Faulkner County. (Ark. Ins. Sur.). MISSISSIPPI - Light on alfalfa and vetch in Lee County. (Dinkins).

SUGARBEETS

BEET ARMYWORM (Spodoptera exigua) - ARIZONA - New larval emergence moderate on sugarbeets in Chandler and Queen Creek areas of Maricopa County. (Ariz. Coop. Sur.).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Poses threat to sugarbeets throughout Pinal and Maricopa Counties. (Ariz. Coop. Sur.).

POTATOES, TOMATOES, PEPPERS

GREEN PEACH APHID (Myzus persicae) - FLORIDA - Adults and nymphs 2-8 per leaf on potatoes at Homestead, Dade County. (Wolfenbarger).

COLE CROPS

DIAMONDBACK MOTH (Plutella xylostella) - FLORIDA - Larvae and adults common on rape at Gainesville, Alachua County. (Mead).

ONION THRIPS (Thrips tabaci) - CALIFORNIA - Medium on cabbage plantings at Thermal, Riverside County. (Cal. Coop. Rpt.).

CUCURBITS

AMERICAN COCKROACH (Periplaneta americana) - ARKANSAS - Damaged seedling watermelon plants in greenhouse at Fayetteville; cut off plants and fed on cotyledons. (Watts, Dec. 30). Same type of damage has been observed for several years on strawberry, tomato and cucurbit seedlings. (Roberts).

CITRUS

CITRUS RED MITE (Panonychus citri) - FLORIDA - Adults severe on 75 percent of 100 sweet orange nursery plants at Goldenrod, Seminole County. (Kipp).

ORNAMENTALS

BAGWORMS - ALABAMA - Numerous bags of Thyridopteryx ephemeraeformis observed throughout State contained large numbers of eggs. Parasitism appears low. (McQueen). NEW MEXICO - "Bags" of undetermined species very abundant on junipers at Portales, Roosevelt County. Some pupae parasitized. (Mathews, Nielsen). CALIFORNIA - T. meadi medium on native greasewood at Apple Valley, San Bernardino County. (Cal. Coop. Rpt.).

A PLUME MOTH (Platyptilia pica) - PENNSYLVANIA - Larvae damaged 30 percent of geranium cuttings at Mt. Pleasant, Westmoreland County. Reared adults determined during January by W. Yackley. (Yackley).

COCONUT SCALE (Aspidiotus destructor) - PENNSYLVANIA - Heavy on blue spruce at Havertown, Delaware County, November 12, 1966. Det. by M. Kosztarab. This is a new State record. (Tetrault).

ARMORED SCALES - VIRGINIA - Fiorinia theae infested Burford holly in Franklin, Southampton County. (Pierce). ALABAMA - F. theae crawlers beginning to appear on undersides of leaves of camellia and holly in central and southern sections. (McQueen). FLORIDA - Aonidiella aurantii light on coontie at Fern Park, Seminole County. This is a new host record. (Kipp, Dec. 1, 1966). Pseudaulacaspis pentagona collected from poinsettia in nursery at Ocala, Marion County. This is new host record. (Holder, Graham, Dec. 13, 1966). CALIFORNIA - Epidiaspis piricola heavy on hollyleaf cherry at several locations in Sacramento, Sacramento County. Diaspis echinocacti heavy on cactus nursery stock at San Diego, San Diego County. (Cal. Coop. Rpt.).

FOREST AND SHADE TREES

LARCH SAWFLY (Pristiphora erichsonii) - MARYLAND - Larvae medium on European and Japanese larch plantation near Grantsville, Garrett County, July 1966. New State record. Collected by D. M. Harman and det. by D. R. Smith. (U. Md., Ent. Dept.).

CITRUS MEALYBUG (Planococcus citri) - CALIFORNIA - Medium on redbay nursery stock at Hawthorne, Los Angeles County. (Cal. Coop. Rpt.).

DOGWOOD CLUB-GALL MIDGE (Mycodiplosis alternata) - ALABAMA - Galls heavy on native dogwoods throughout State. (McQueen).

MAN AND ANIMALS

CATTLE GRUBS (Hypoderma spp.) - OKLAHOMA - H. lineatum ranged 0-6 per head on yearlings and 0-8 on cows in Payne County. Heavy in Okfuskee County and light in Mayes County. (Okla. Coop. Sur.). KANSAS - H. lineatum counts per head on steers by county as follows: Atchison 0-3, Shawnee 0-3, Miami 0-5, Harvey 0-9, Sedgwick 0-17. (Simpson). UTAH - Hypoderma spp. appearing in backs of cattle in Cache County. (Knowlton).

SCREW-WORM (Cochliomyia hominivorax) - No cases reported in U. S. February 12-18. Total of 64 cases reported in portion of Barrier Zone in Republic of Mexico February 5-11 as follows: Territorio sur de Baja California 2, Sonora 46, Coahuila 2, Nuevo Leon 1, Tamaulipas 13. No cases in Mexico south of Barrier Zone. Barrier Zone is area where eradication operations are underway to prevent establishment of self-sustaining population in U. S. Sterile screw-worm flies released February 12-18: Texas 16,648,000, Mexico 105,080,000. (Anim. Health Div.).

HORN FLY (*Haematobia irritans*) - ALABAMA - Few adults emerged in Lee County during extended summer-like period in January; disappeared following freezing temperatures. (Bourne). MISSISSIPPI - Surveys negative in Oktibbeha and Lowndes Counties. (Dinkins).

MOSQUITOES - LOUISIANA - Larval collections in Jefferson Parish contained *Aedes triseriatus*, *A. vexans*, *Culex restuans*, *C. salinarius*, and *Culiseta inornata*. Adult activity low throughout parish. *Culex salinarius* and *Culiseta inornata* dominated light trap collections with very few floodwater species taken. (Stokes). CALIFORNIA - Due to few warm days, mosquitoes emerged to plague residents in most areas but were somewhat subdued by cool nights. Populations were heavier than past 3 or 4 years. (Cal. Coop. Rpt.).

CATTLE LICE - IOWA - Total of 25 cattle hides from Adair and Guthrie Counties examined. *Bovicola bovis*, *Solenopotes capillatus*, and *Haematopinus eurysternus* adults were light, less than 5 per examination on 24 hides but over 10 on one hide. (Iowa Ins. Sur.).

WINTER TICK (*Dermacentor albipictus*) - OKLAHOMA - Heavy on horses in Mayes County; 1,000+ per head. (Okla. Coop. Sur.).

HOUSEHOLDS AND STRUCTURES

SUBTERRANEAN TERMITE (*Reticulitermes* spp.) - OKLAHOMA - Swarming on warm days in Oklahoma and Canadian Counties. (Okla. Coop. Sur.).

BOXELDER BUG (*Leptocoris trivittatus*) - NEW MEXICO - Very abundant in and around homes in Mimbres Valley area, Grant County. (Elson, Hinrichs).

FEDERAL & STATE PLANT PROTECTION PROGRAMS

PINK BOLLWORM (*Pectinophora gossypiella*) - NEW MEXICO - Survey of cotton fields with standing stalks or shredded stalks not yet plowed under indicated high degree of larval survival in cocoons on roots of plants; 50-87 percent of larvae alive. (Bartholf, Judd, Mathews).

GRASSHOPPERS - OKLAHOMA - Egg pods per square foot averaged as follows by county: Cherokee - 0.2 at 3 stops; Coal - 0.33 at 4 stops; Delaware - 0.5 at 3 stops. Negative at 2 stops in Pittsburg County. (Okla. Coop. Sur.).

CARIBBEAN FRUIT FLY (*Anastrepha suspensa*) - FLORIDA - Larva taken from tangelo fruit at Pompano Beach, Broward County. (Brien, Feb. 2).

IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) - FLORIDA - Collected near Cross City, Dixie County, January 25, 1967, for new county record. Det. by H. A. Denmark, confirmed by D. R. Smith. (Tipton). NORTH CAROLINA - Collected in Columbus County during January for new county record. (PPC South. Reg.).

HAWAII INSECT REPORT

New State of Hawaii Insect Record - AN ASTEIID FLY (Asteia n. sp.) was collected in a light trap at Honolulu, Oahu, July 18, 1966. Det. by C. W. Sabrosky. This fly unlike any known species in Pacific area. (Joyce).

Sugarcane - NEW GUINEA SUGARCANE WEEVIL (Rhabdoscelus obscurus) caused heavy damage to old canes this season. A tachina fly (Microceromasia sphenophori) apparently not effective parasite in fields of mature canes. (Au).

Fruits and Nuts - Population increase of SOUTHERN GREEN STINK BUG (Nezara viridula) noted in Kona District, Hawaii Island. Introduced egg parasites currently ineffective as indicated by nymphal increase. Damaged 4-5 percent of macadamia nuts and expected to increase in next few months. Nymphs light but widespread on tomatoes, ornamentals and weeds from Kainaliu to Honaunau. (Yamayoshi, Himori).

Ornamentals - Second and third-stage larvae of a NOCTUID MOTH (Achaea janata) light on croton at Hana, Maui. Damage light on new growth. (Davis, Miyahira).

Forest and Shade Trees - A PLATASPID BUG (Coptosoma xanthogramma) medium at Kaneohe, Oahu Island, on indigo, apparently a new host. Adults and eggs continue heavy on sesban trees. Adults, eggs, and nymphs light on terminals of coral trees. (Bianchi, Funasaki). Light buildup of CUBAN-LAUREL THRIPS (Gynaikothrips ficorum) noted on Chinese banyan at Kapaa, Lihue and Eleele, Kauai Island. A predacious anthocorid bug (Montandoniola moraguesi) was active at Lihue and Eleele. Slight buildup of G. ficorum noted on Chinese banyan in Waialae area of Honolulu, Oahu Island. (Au, Nakao).

Beneficial Insects - All stages of a NOCTUID MOTH (Hypena strigata) very heavy on lantana at Ulupalakua, Auwahi, Makawao, Kahului, and Wailuku, on Maui. At Ulupalakua and Auwahi, approximately 25,600 acres of lantana 50-100 percent defoliated. (Miyahira, Davis, Takishita). Larvae of a TORTRICID MOTH (Aptoforma sp.) medium on blackberry in Halemanu Valley, Kokee State Park, Kauai. This species first released during August 1964 and considered well established in blackberry infested areas of Kauai and Maui. (Au).

Miscellaneous Pests - GIANT AFRICAN SNAIL (Achatina fulica) was found for first time in over a year on Hawaii Island. All stages abundant at Hana, Maui. (Davis, Miyahira). A MUSCID FLY (Graphomya maculata) collected near Hilo Airport, Hawaii Island, December 6, 1966. This is first record from Hawaii Island; previously reported from Oahu and Maui. (Joyce).

WEATHER OF THE WEEK ENDING FEBRUARY 20, 1967

HIGHLIGHTS: Cold and windy northern Plains to New England.

PRECIPITATION: Spotty, heavy snow fell over the northern half of the U. S. on several days, with up to 10 inches accumulating in the Black Hills of South Dakota and 8 inches in portions of Minnesota. The Ozarks of Missouri and Arkansas received 10 inches of snow on Thursday with lesser amounts eastward across the Ohio River Valley, Kentucky and Tennessee to the Atlantic Coast and northward to New England. Freezing rain glazed the roads south of the snow area. Moderate rains fell in the Gulf States and the South Atlantic States. Precipitation totals along the coastal portions of Washington and Oregon ranged from 2-4 inches or more. Wide areas from southern California across Arizona and New Mexico to the western portions of Kansas, Oklahoma and Texas received little or no rain.

Weather continued on page 120.

INSECT DETECTION

New State Records

COCONUT SCALE (*Aspidiotus destructor*) - PENNSYLVANIA - Collected from blue spruce at Havertown, Delaware County, November 12, 1966. Det. by M. Kosztarab. (p. 117).

LARCH SAWFLY (*Pristiphora erichsonii*) - MARYLAND - Larvae collected from European and Japanese larch near Grantsville, Garrett County, July 1966. Collected by D. M. Harman and det. by D. R. Smith. (p. 117).

AN ASTEIID FLY (*Asteia* n. sp.) - HAWAII - Collected in a light trap at Honolulu, Oahu, July 18, 1966. Det. by C. W. Sabrosky. (p. 119).

New County and Island Records

IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) - FLORIDA - Collected in Dixie County. NORTH CAROLINA - Collected in Columbus County. (p. 118).

A MUSCID FLY (*Graphomya maculata*) - HAWAII - Collected on Hawaii Island. (p. 119).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville - 2/15, 1 BL - Black cutworm (*Agrotis ipsilon*) 2, granulate cutworm (*Feltia subterranea*) 10. SOUTH CAROLINA - Charleston - 2/6-12, BL, temp. 32-64°, precip. 2.63 - Armyworm (*Pseudaletia unipuncta*) 1, yellow-striped armyworm (*Prodenia ornithogalli*) 2, black cutworm 2, granulate cutworm 11. TEXAS - Brownsville - 2/4-10, 2 BL, temp. 33-78°, precip. 0.15 - Black cutworm 164, salt-marsh caterpillar (*Estigmene acrea*) 5, granulate cutworm 98, tobacco budworm (*Heliothis virescens*) 2, corn earworm (*H. zea*) 51, variegated cutworm (*Peridroma saucia*) 15, yellow-striped armyworm 156, armyworm 85, beet armyworm (*Spodoptera exigua*) 6, cabbage looper (*Trichoplusia ni*) 13.

Weather continued from page 119.

TEMPERATURE: The northcentral States were in the deep freeze during the entire week. The highest temperature at Sault Ste. Marie, Michigan, was 32 degrees. The temperature at Fargo, North Dakota, stayed below zero from Wednesday until Saturday while Sioux City, Iowa, registered subzero temperatures on 3 mornings. Brief warming from northern Texas to southern Nebraska on Monday and Tuesday ended suddenly; Omaha's temperature dropped from 71 degrees on Tuesday afternoon to 28 degrees at midnight, and to minus 40 by midnight Wednesday. The northeast was cold at the beginning and end of the week but briefly warm at mid-week. In Washington, D. C., the temperature fell from 63 degrees Thursday afternoon to 28 degrees by Friday morning. Temperatures in northern New York and New England dropped to 30 degrees below zero or colder early and late in the week. Wanakena, New York, registered minus 48 degrees on Monday; Houlton, Maine, minus 36 degrees Saturday. Temperatures over the northcentral Great Plains and northern New England averaged 10 degrees to 15 degrees below normal. The Western States, from the Pacific Ocean to the Rockies, continued mild for the 6th consecutive week.

STRONG WINDS: Strong winds associated with the cold air outbreaks battered northern portions of the Country during the week. In the western Great Plains it caused soil erosion and crop damage. In Ohio, strong winds ranged from 30 to 81 m.p.h. and continued for 7 hours, left a trail of shattered windows, mangled trees and utility poles, dented automobiles, roofless homes and fallen wires. In New England winds reached hurricane force damaging trees, buildings, construction equipment and utility lines. (Weather supplied by Environmental Data Service, ESSA).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1966

INTRODUCTION

The summary of insect conditions, beginning in this issue, will be continued in several succeeding issues of the Cooperative Economic Insect Report. This was compiled in Survey and Detection Operations from annual summaries that were submitted by various State and Federal cooperators. A list of the individuals who assisted in assembling data, as well as a summary of the weather for 1966, will appear after the last section of this summary is published. Survey and Detection Operations appreciates the assistance of all individuals who have participated in the preparation of material for the 1966 summary.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

Highlights:

ARMYWORM damaged a variety of crops in California, Texas, Nebraska and South Dakota. Some controls were required in North Dakota, Minnesota and Wisconsin. Populations were heavier than in 1965 in Arkansas and Nebraska. CORN EARWORM populations were lighter than in 1965 in most States reporting; however, sweet corn was severely damaged in Pennsylvania, Virginia, and Florida. HORNWORMS were heavier than normal in Florida, Virginia, Maryland and Rhode Island. CORN LEAF APHID was normal in most States, but heavy populations were damaging in isolated areas. GREENBUG was heavy on small grains in several Southern States, but SPOTTED ALFALFA APHID was light in most States reporting. POTATO LEAFHOPPER populations were high in Maryland, Delaware and Vermont; relatively light elsewhere. SIX-SPOTTED LEAFHOPPER damaged vegetables in Michigan, Wisconsin and Colorado. BEET LEAFHOPPER damaged sugarbeets in Nevada and Colorado and destroyed some tomatoes in Utah.

ARMYWORM (Pseudaletia unipuncta) was unusually abundant on sorghum and grain crops in CALIFORNIA, but remained normal throughout the season in UTAH. Damage was heavy to grain sorghum in the High Plains of TEXAS during early August. Heaviest damage was to pastures, small grains and lawns in several areas of Texas during early fall; however, lighter than in previous years. Populations were heavier than in 1965 in ARKANSAS with considerable wheat acreage requiring treatment. Armyworm moths were first collected in light traps at Portageville, MISSOURI, April 2; up to 200 larvae per square foot were reported in small grain in southeast area. Most damage was observed in the eastern half of Missouri with light damage reported in central and northwestern areas. Armyworm was noneconomic in KANSAS wheat. Scattered, heavy populations damaged some corn in August in Saunders and Dawson Counties, NEBRASKA, and some controls were applied. Populations were heavier than in 1965. Armyworm severely damaged corn in Clay County, SOUTH DAKOTA, by the end of July, and was collected from millet near Britton, Marshall County, during the first week of August. Scattered, isolated infestations were present in eastern NORTH DAKOTA; light to moderate damage occurred in barley and some controls were applied.

Armyworm flights were observed during June in MINNESOTA and some larval infestations in the west-central area required control. In WISCONSIN moths were collected in blacklight traps during mid-May with larvae heavy in grassy alfalfa in Walworth and Rock Counties by June 10. Sustained heavy moth flight occurred July 1 to July 22. Armyworm larvae were common in corn and oats, in July; and required some control. Moths and larvae were common from August 1 until frost, but noneconomic. Larvae first appeared in southern ILLINOIS May 3.

and by late May populations in wheat varied 0-12 per linear foot in southern areas. Approximately 111,916 acres of small grain and 12,438 acres of corn were treated. Moth flights were heavy in northern Illinois in late June and early July. Some leaf notching was observed in grassy cornfields. Damage to corn and small grains was very light in INDIANA. Populations were generally above normal in MARYLAND with over 800 acres of small grains treated during early June.

CORN EARWORM (*Heliothis zea*) was generally light throughout RHODE ISLAND, but damaged ears of late sweet corn generally over PENNSYLVANIA. Numbers in early and late corn were normal in MARYLAND, with heaviest ear infestations occurring in corn maturing during late August and September. Populations were light to moderate in corn and considerably lighter in soybeans in DELAWARE, compared with 1965. Corn earworm was scarce early this year in VIRGINIA, but caused considerable damage to late sweet corn, fall snap beans, late tomatoes, broccoli and peppers. Numbers were light on soybeans and peanuts. Corn earworm severely damaged sweet corn at Ruskin, Hillsborough County, FLORIDA, during late spring and was heavy on sorghum at Live Oak, Suwannee County, during September. This noctuid also infested watermelon rinds at Leesburg, Lake County. Populations were widespread in ALABAMA and damaged corn, sorghums, peanuts, soybeans, cotton, tomatoes and other crops. Corn earworm was a major pest of soybeans in southern Alabama and caused light damage in central and northern areas.

Adults were first trapped at Portageville, MISSOURI, May 24 and larvae damaged late-planted soybeans in southeast area where controls were required. Populations in ILLINOIS were heavier than in 1965. Corn losses in southern Illinois were 0.10 percent compared with 0.057 percent in 1965. This increase was partly due to drought. Infestations in INDIANA were much lower in 1966. The fall corn insect survey showed 2.6 percent of corn infested with corn earworm in 1966 compared with 11.6 percent in 1965. The heaviest infestations occurred in the southern quarter of Indiana. Very few corn earworm larvae were reported from southern MICHIGAN. The usual late summer moth flight from southern areas did not occur. Only 4 moths were taken in blacklight traps during the second week in September, thus seasonal catches for 1966 were the lightest recorded during recent years. Moths were first collected in blacklight traps July 29 in WISCONSIN. Moths and larvae were light and little damage to corn occurred.

Corn earworm was light in early sweet corn in eastern NEBRASKA with some light damage to corn observed in southeast and central areas. Populations were lower than usual on corn in most areas of KANSAS, and remained below economic levels throughout the season. Larvae were light on alfalfa in late summer and caused light damage to soybeans in the southeast area during August. Corn earworm infested up to 80 percent of sweet corn tassels in Sedgwick County during late June. Populations were variable in northeast Kansas and light in western areas. Activity was first noted in corn in south-central OKLAHOMA during mid-May. Infestations increased during June and moderate to heavy numbers damaged crops during early fall in many areas. Corn and grain sorghums were most heavily infested but larvae were also found in alfalfa, peanuts, and soybeans with activity common through mid-October.

Corn earworm was economic on corn in southeastern, western and northeastern COLORADO with some controls necessary. Populations in MONTANA were spotty in 1965 with fewer numbers than in 1966. It does not overwinter in Montana but migrates from areas farther south.

Corn earworm damage varied from minor to severe in late-maturing hybrid sweet corn in south-central and southwestern IDAHO. Some fields were 100 percent infesed with 4 larvae per ear. Seed loss was 10 percent. Moths were collected in light traps May 3 at Prosser, and May 14 at Othello, WASHINGTON, a month earlier than previous records. Seasonal populations on corn were only moderate, however. Corn earworm was heavy as usual on sweet and field corn in eastern OREGON. Adults first appeared June 7 in Umatilla County and infestations reached 95 percent by August. Damage to sweet corn in the Willamette Valley remained low except in a few late plantings. Damaging populations appeared in May in

CALIFORNIA and persisted through the year, being severe on corn, beans and milo statewide. Continuous controls were necessary on spring truck crops, and moderate numbers damaged lettuce in the fall. Corn was severely damaged during May, June and July in California.

TOBACCO BUDWORM (Heliothis virescens) caused light damage on late beds of tobacco in FLORIDA, and was transferred to the field on transplants in several instances. Budworm infestations on cigar-wrapper tobacco increased as most growers reduced the number of insecticide applications after Hurricane Alma passed through the Gadsden County area. Tobacco budworm infested watermelon rinds in Lake County, and damage varied with the degree of control application as well as with other factors.

ARMY CUTWORM (Chorizagrotis auxiliaris) caused losses to sugarbeets in Larimer and Weld Counties, COLORADO, and was also reported on wheat. Spotty populations on alfalfa in Hot Springs, Washakie, Big Horn and Park Counties, WYOMING, in early May caused some loss to wheat in fields already damaged by winter kill. Larvae averaged 1-2 per square foot in most heavily infested fields. Army cutworm caused light to moderate damage to wheat in southwest and west-central KANSAS during April and May, with controls applied in some instances. Populations were very light throughout NEBRASKA, but sugarbeets were moderately damaged near Hunter, NORTH DAKOTA. Army cutworm was spotty on wheat in Yellowstone County, MONTANA, and infestations were reported in Lincoln, Big Horn, Dawson, Carbon and Chouteau Counties.

TOBACCO HORNWORM (Manduca sexta) was found in more tobacco fields in FLORIDA during 1966 than in previous 3 years; however, damage was light. Light trap collections were lighter than in 1965. In VIRGINIA, collections of HORNWORMS (Manduca spp.) were higher than in 1965. For the second consecutive year, a larger hornworm brood was observed on tobacco in Virginia and MARYLAND. TOMATO HORNWORM (M. quinquemaculata) was the heaviest on vegetable crops for many years in RHODE ISLAND. Adults were collected July 5 in Madison, WISCONSIN, and larvae were detected on tobacco in Dane County July 29, with pupation completed by August 12. Hornworms, mostly tobacco hornworm, were light on tomatoes in OKLAHOMA during July and August and on bell peppers in September. Tomato hornworm severely injured tomato plantings in Doniphan County, KANSAS, during September and early October. Hornworms ranged low to moderate on tomatoes in COLORADO, with light losses to the crop. Hornworms were common although seldom economic in MONTANA, but were widespread on tomatoes in CALIFORNIA.

MELONWORM (Diaphania hyalinata) was the most serious pest of cucumbers and cantaloups in ALABAMA, and PICKLEWORM (D. nitidalis) infested 35 percent of unsprayed summer squash at Gainesville, FLORIDA.

CORN LEAF APHID (Rhopalosiphum maidis) was in normal abundance throughout RHODE ISLAND, being more common on field corn than sweet corn. Infestations were heavy on corn in most areas of DELAWARE and continued to build up into late fall. Populations were light to medium on corn throughout VIRGINIA during July and August, and predators were numerous.

Corn leaf aphid was first observed in central, southeastern, and southwestern OHIO in late July, increased through August and declined as corn matured. Tassel damage to most corn was very light and only some undersized or late-planted corn harbored large populations. High predator numbers over much of Ohio, in addition to advanced corn conditions, resulted in only incidental interference with corn pollination. New colonies were common near tassels in corn-growing areas of MICHIGAN during late July. Timely rains permitted normal tasseling in all areas, except in droughty areas, where some fields harbored populations in excess of 1,000 aphids per plant through late September. In INDIANA, corn leaf aphid severely infested 4.0 percent of corn sampled, was moderate on 12.4 percent, and light on 29.6 percent. Maximum infestations occurred in the southern quarter of the State where an average of 73.3 percent of plants were infested. Species was heavy and severely damaged field corn in ILLINOIS. Early in August, 15 percent of corn in western area was heavily infested. Approximately 79,649 acres of corn were treated in Illinois. Corn leaf aphid was observed on corn in MISSOURI.

Corn leaf aphid colonies began forming on corn the first week of July in Dane County, WISCONSIN, and increased rapidly with very high populations common through late August when populations collapsed due to heavy rains. Populations were high on corn by late July in MINNESOTA. Predators developed rapidly and reduced aphid population to low levels by mid-August. Corn leaf aphid ranged light to heavy throughout NORTH DAKOTA appearing in late July and continuing through October. Infestations were heaviest in late-planted corn. Populations were common in southeastern SOUTH DAKOTA corn from July to August and into late September on green cobs. By mid-July, 150-200 aphids per plant infested sorghum in Hutchinson and Yankton Counties. Although counts were high in some fields, no controls were recommended since parasites and predators effectively reduced populations to low levels. Corn leaf aphid began increasing on corn and sorghum in NEBRASKA in late June and was heavy by early July. The buildup was earlier and heavier than in 1965. Populations were heavy in grain sorghum in many areas of KANSAS and, in conjunction with drought, caused some damage. Controls were applied in many instances. Populations on corn in Kansas remained noneconomic.

Corn leaf aphid necessitated controls on corn in some areas of COLORADO while populations on sorghum were low to moderate and no controls were required. Colonies were first noted in southeastern WYOMING July 20 and were lower than in 1965. Approximately 15 percent of corn was infested; large numbers of predators were present. Migration from barnyard grass to hybrid corn in Canyon County, IDAHO, occurred during early June. Populations caused late-planted barley to yellow in Bingham, Power and Twin Falls Counties by August 10. Corn leaf aphid and ENGLISH GRAIN APHID (*Macrosiphum avenae*) began increasing in June and required controls in some areas of NEVADA, especially in Churchill, Lyon and Pershing Counties, through early August. Corn leaf aphid infested sweet corn locally in Fresno County, CALIFORNIA. Infestations were moderate on small grains in Maricopa, Yuma, Pinal and Pima Counties, ARIZONA, but lower than in 1965.

Corn leaf aphid was heavy on young grain sorghum in TEXAS. This aphid, thought to be a vector of maize dwarf mosaic, was found distributed throughout Texas in the same pattern as the virus. Corn leaf aphid was light in small grains in OKLAHOMA through March and from mid-October through December. Activity in sorghum began in mid-June with moderate to heavy numbers present and was heavy on late corn in scattered areas during August. Populations were heavier than usual throughout ALABAMA. Maize dwarf mosaic appeared more general throughout the State than previously. The increase in aphids may have been a contributing factor.

GREENBUG (*Schizaphis graminum*) was light on small grain in Quay, Curry, and Roosevelt Counties, NEW MEXICO. Populations were widely distributed on grain throughout the High Plains, Rolling Plains and north and central areas of TEXAS. Populations were generally light to moderate. Highest counts of 1,000-2,000 per square foot were noted during March and April in Swisher, Hill, Smith, and Bell Counties. Greenbug infestations were heavy in insolated areas of OKLAHOMA during late January and February but decreased during early March. Populations again increased during mid-March with damaging numbers present in scattered areas through early April. Highest counts, up to 3,000 per linear foot, were in eastern Major County, but counts of 500-1,000 per linear foot were present in several northwest and southwest Oklahoma areas. Activity continued through April. Fall activity began in the panhandle area of Oklahoma in mid-October and was light in most areas the rest of the year. Greenbug was noneconomic in ARKANSAS. Infestations required controls in coastal areas of ALABAMA, especially in Mobile and Baldwin Counties, and was light in small grains throughout the State. Greenbug was serious on barley and oats in Mathews County, VIRGINIA, during late November.

Greenbug overwintered in south-central and southeast KANSAS. By early January, populations had reached 1,000+ per linear foot in Chautauqua and Montgomery Counties. Numbers decreased in late January but again reached economic levels by early April; however, a hard freeze on April 21 damaged wheat to such an extent it became uneconomic to apply controls. Winged adults were found April 29 in eastern NEBRASKA and some economic damage to wheat in Nuckolls and Gage Counties occurred in May. Specimens of greenbug were collected from small grains in eastern SOUTH DAKOTA, and trace numbers evident in NORTH DAKOTA by late May, but no economic numbers developed. Greenbug populations were low by late April in MINNESOTA and were detected in WISCONSIN during mid-May after a strong southern air stream had passed through that State. A marked increase of greenbug during late May occurred on oats in southern and western Wisconsin counties causing concern over potential "red leaf" problems. Incidence of "red leaf" was low and most oats matured before significant infection occurred. Greenbug was widespread in ILLINOIS this year, but populations remained low.

SPOTTED ALFALFA APHID (Therioaphis maculata) became heavy on alfalfa in areas of Churchill and Pershing Counties, NEVADA, during the summer and required controls. Some buildup occurred at a few locations in CALIFORNIA. Spotted alfalfa aphid was low on alfalfa in Umatilla and Morrow Counties, OREGON, during early October. In IDAHO, spotted alfalfa aphid first noted August 19, two weeks earlier than usual, and was general throughout the Indian Cove area on third-cutting alfalfa. Late activity was observed as usual throughout southwestern Idaho. Spotted alfalfa aphid was less numerous in Laramie, Platte and Goshen Counties, WYOMING, than in 1965. First specimens of the season were noted June 28, and highest counts averaged 15-25 per 100 sweeps in Goshen County during September. Sexual forms were collected in Wyoming September 21. Spotted alfalfa aphid was a potential threat to newly seeded alfalfa in the Arkansas Valley of COLORADO and caused minor damage to alfalfa throughout NEW MEXICO. Spotted alfalfa aphid caused no economic damage in TEXAS during 1966, but was light to moderate in Brazos and Burleson Counties. Spotted alfalfa aphid populations ranged moderate to heavy on alfalfa in northwest OKLAHOMA from January through early May, then decreased through June in most areas. Moderate to heavy numbers again appeared over much of Oklahoma in July and early August. Numbers decreased on alfalfa during August and were light in all areas until mid-November. During late November and December, scattered heavy populations were present on alfalfa in northeast Oklahoma. Spotted alfalfa aphid became heavy during dry weather in June and early July in ARKANSAS, but was lighter the remainder of the year. Spotted alfalfa aphid was noneconomic on alfalfa during the summer in KANSAS, and predators held populations in check during August. Populations averaged 0.2-3 per 10 sweeps on alfalfa in southeast NEBRASKA from May through August, but increased to an average of 55 per 10 sweeps in the central area during August. Some damage to alfalfa was observed in western Custer County. Spotted alfalfa aphid ranged 3-25 per 100 sweeps in central SOUTH DAKOTA, and was recorded for the first time in Dewey, Ziebach, Corson, Harding, Butte and Codington Counties. To the present, spotted alfalfa aphid has been known only in endemic numbers in South Dakota. Wingless forms were detected in June on alfalfa near Brodhead and Arena, WISCONSIN. Populations increased until late July when there was a marked increase. A sharp decrease occurred in mid-August after severe storms. Dispersal flights began one week later and egg-laying females were noted in mid-October. Spotted alfalfa aphid was first observed May 9 and by June 30 was found throughout ILLINOIS. Some damage occurred to alfalfa planted on sandy soils in the northwest area where populations reached 89 per sweep July 11-14 and in a few southern counties late in the fall. Spotted alfalfa aphid, found for first time in MICHIGAN in 1965, was widely dispersed throughout alfalfa-growing areas of the State in 1966, but remained at low levels. The first seasonal specimen was taken June 7 in Lenawee County. Collections were rare until early August, becoming common by mid-September.

POTATO LEAFHOPPER (Empoasca fabae) populations on alfalfa in all sections of MARYLAND were considerably above normal; counts of over 100 nymphs per sweep were common in many unprotected fields during July and August. Populations were above normal with extensive damage on late potatoes and conspicuous injury to unprotected snap beans during June and July on the Eastern Shore. Nymphs and adults were very numerous on untreated beans during much of the growing season in DELAWARE. Potato leafhopper was generally low on alfalfa and light on potatoes in PENNSYLVANIA. Some alfalfa was damaged in VERMONT by populations of 3-5 per sweep.

Potato leafhopper was normal throughout the season in UTAH. Light populations were found in many alfalfa fields in northeastern KANSAS during mid-June but no damage was observed. Counts ranged 0.5-60 per 10 sweeps on alfalfa in eastern NEBRASKA from May to August and were generally light in central and southwest areas during August. No economic infestations were evident in NORTH DAKOTA. In WISCONSIN, adults were detected on alfalfa late in May, with reproduction evident by mid-June. Yellowing of alfalfa was observed early in July and was common although not severe most of the season. Populations on lima beans in Rock County were high and "hopperburn" on potatoes was noted early in August.

First potato leafhopper adults were observed in southern ILLINOIS during early May; populations peaked in late June and early July. Considerable yellowing was observed in second-crop alfalfa; 4,548 acres treated. Populations peaked in INDIANA during late July when adults and nymphs ranged 6-40 per sweep on alfalfa. Damage and highest populations occurred along with extreme hot weather from June 22 through July 18; some yellowing occurred. First adults of the season in MICHIGAN were collected in Monroe County May 20. Adults increased in July and peaked at 2.6 per sweep in the southeast area during late July. Statewide problems were relatively low this year. Potato leafhopper was not generally damaging to alfalfa in OHIO where counts ranged 3-20 per sweep in 15 counties from July to September.

SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) adults were first collected May 6 in Livingston County, MICHIGAN, for an extremely early collection date and were numerous in Jackson County lettuce fields by early July. During July, the incidence of aster yellows on celery, lettuce, onions and carrots became high in practically all muck-vegetable areas of Lower Michigan. Six-spotted leafhopper was reported for the first time from 11 counties in INDIANA. Populations were light from May through August in the southern third of the State; however, during mid-September, counts ranged 22-116 per sweep in southwestern area alfalfa.

Six-spotted leafhopper adults were detected in small grain in WISCONSIN the first week of May, and populations increased gradually. Tests indicated a high percentage were viruliferous. Early in July, aster yellows virus infected 20 percent of early lettuce in some central counties. Six-spotted leafhopper migrated into MINNESOTA in early April with high numbers present from May to September. A low percentage of leafhoppers carried aster yellows, and economic damage was low. Migratory adults were present in late May in eastern NORTH DAKOTA.
Six-spotted leafhopper was common on wheat in southwest OKLAHOMA during October but caused little damage. Populations were economic on onions in the Arkansas Valley of COLORADO and transmitted aster yellows virus to onions in Otero County, but losses were light. Lettuce in Otero County was moderately damaged. Six-spotted leafhopper was normal in UTAH during 1966.

BEET LEAFHOPPER (Circulifer tenellus) transmitted curly top disease to sugarbeets in Pershing County, NEVADA, resulting in medium to heavy damage to some of the crop. In UTAH this leafhopper spread curly top which destroyed 25-35 percent of tomato plants and infected a larger than normal number of small sugarbeets and table beets in Weber County during the spring. Beet leafhopper caused losses to tomatoes in COLORADO, and was a major problem on sugarbeets in the Western Slope area and in the Arkansas Valley. Curly top symptoms were first noted during late July in WYOMING and were found in 12 percent of sugarbeet plants in Washakie and southern Big Horn Counties. Most serious damage was to late-planted sugarbeets. The spring survey in Wyoming showed a population of 0.24 leafhopper per square foot of host compared with 0.23 in the spring of 1965. No control program was instigated as in previous 3 years. Beet leafhopper averaged more than one per square foot on 30,000 acres in IDAHO during March. The infestation increased to 42,000 acres following favorable weather conditions in May. Drought immediately followed control treatment and reduced populations outside the severely infested areas. Movement into cultivated areas of Idaho was very light during 1966.

POTATO PSYLLID (*Paratrioza cockerelli*) was moderate and occasional heavy infestations plagued potato growers in Maricopa and Pinal Counties, ARIZONA, during March and April. Overall populations were slightly higher than in 1965. Potato psyllid populations were below average during the season in UTAH. Numbers were moderate to high on *Lycium* sp. during early spring in COLORADO. Populations were moderate in a few fields of potatoes and required some control. No losses were attributed to this insect in Colorado in 1966. Although adult counts were lower in WYOMING than in 1965, yield of untreated potatoes and tomatoes declined in all areas. Eggs were first found on *Lycium* sp. May 20 in Goshen County. Adults were not found in northern areas until late June. Peak populations were reached in late July when adults in potatoes averaged 1.5-3 per 100 sweeps.

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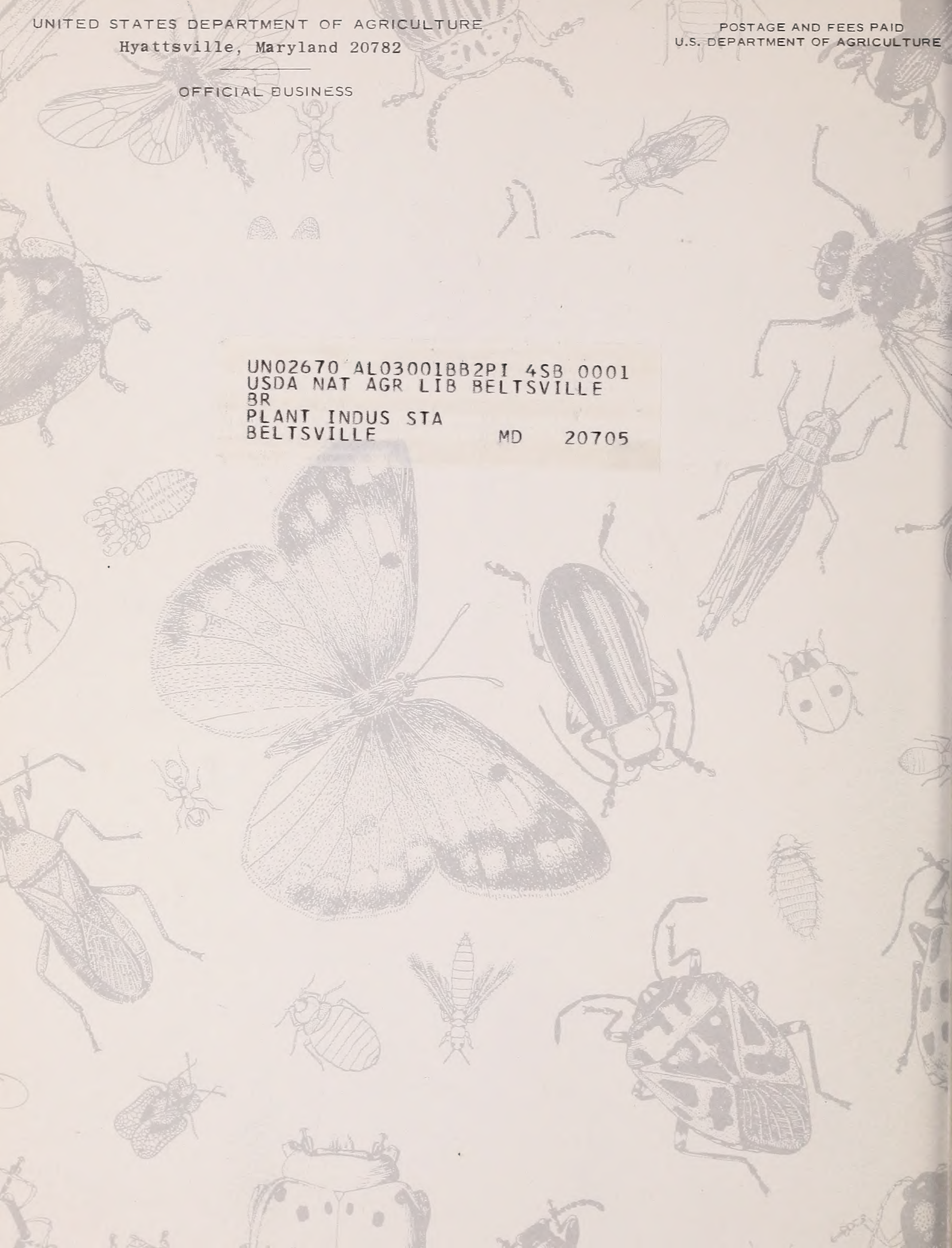

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